Data Controller
Chip

Read Channel
Chip

| ECC Encoder 105 | Constraint Encoder 110 | Post Processing Encoder 115 | Write Logic and Driver 120 |

Data In

Analog Out

Figure 1A

Analog In

| AFE 150 | ADC 155 | FIR 160 |

Data Equalized to
the Target

Corrected
Data Out

| Viterbi Detector 165 | Post Processor 170 | Constraint Decoder 175 | ECC Decoder 180 |

Read Channel
Chip

Data Controller
Chip

Figure 1B

```
┌──────────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│  Constraint  │      │              │      │Post Processing│      │              │
│   Encoder    │─────▶│ ECC Encoder  │─────▶│   Encoder    │─────▶│Write Logic and│
│     205      │      │     210      │      │     215      │      │    Driver    │
└──────────────┘      └──────────────┘      └──────────────┘      └──────────────┘
Data In                                                                      Analog Out
```

Figure 2A

Analog In

```
┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│              │      │              │      │              │
│     AFE      │─────▶│     ADC      │─────▶│     FIR      │──┐
│              │      │              │      │              │  │
└──────────────┘      └──────────────┘      └──────────────┘  │
                                                               │
┌──────────────┐      ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│              │      │              │      │              │      │  Constraint  │
│Viterbi Detector│───▶│Post Processor│────▶│ ECC Decoder  │─────▶│   Decoder    │─────▶
│              │      │              │      │     275      │      │     280      │
└──────────────┘      └──────────────┘      └──────────────┘      └──────────────┘
                                                                      Corrected
                                                                      Data Out
```

Figure 2B

Figure 3

Figure 4

Poeppelman
01-572
Method and Appratus for Enhancing Correction
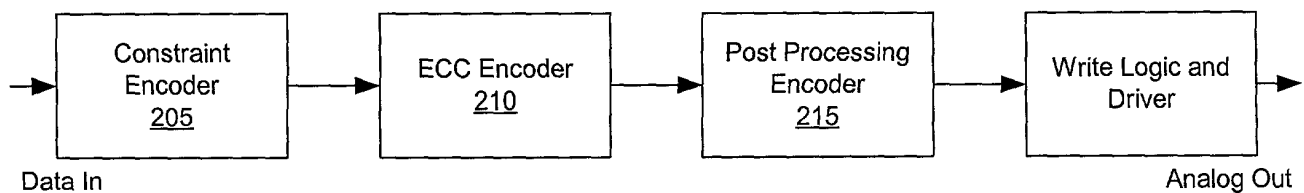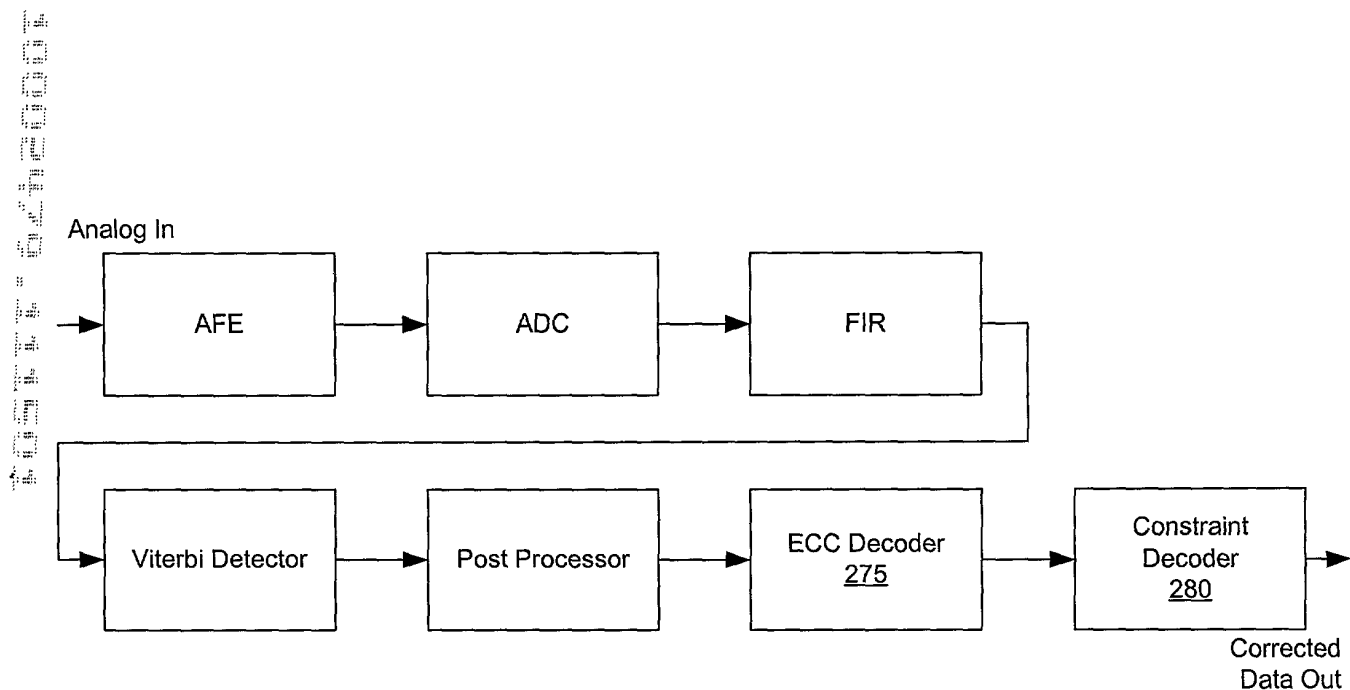Power of Reverse Order Error Correction Codes
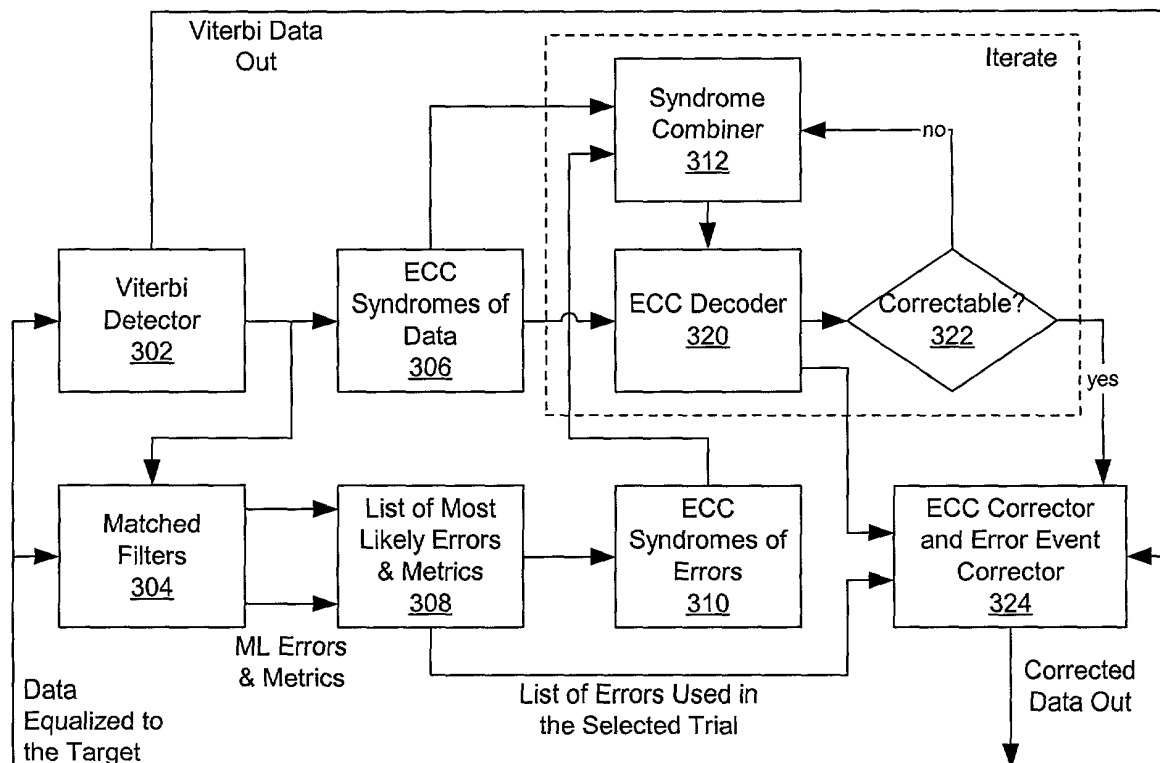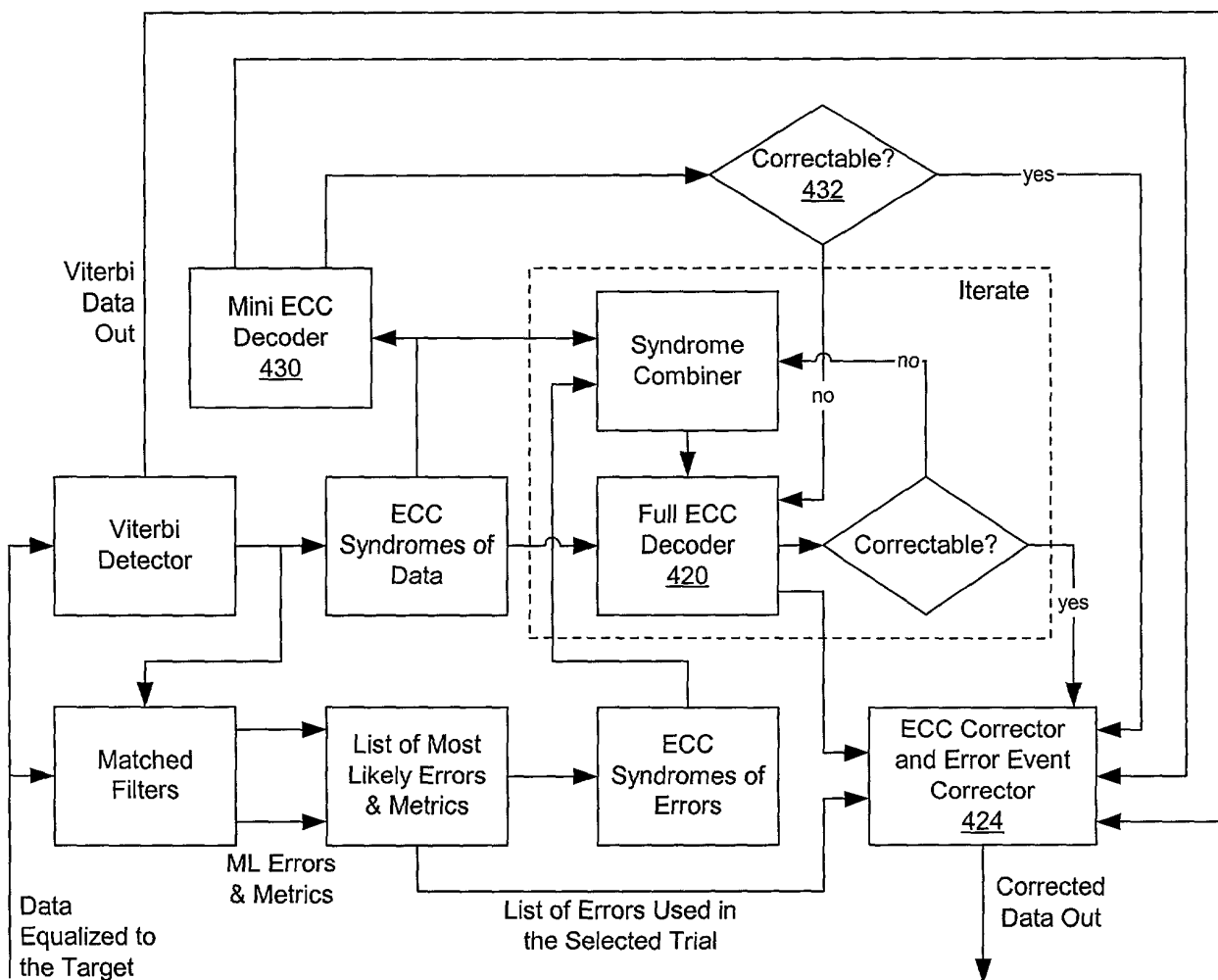Page 4 of 5

Figure 5

Begin

Receive Viterbi Data
and Most Likely Errors
and Metrics
502

Calculate ECC
Syndromes of Data
504

Syndromes of Data

Use Subset of the
Syndromes in the Mini ECC
Decoder to Offload the Full
ECC Decoder
506

Syndromes
of Data

Calculate ECC
Syndromes of Errors
512

Syndromes
of Errors

Use Full Set of
Syndromes in Full ECC
Decoder
514

no

Correctable by
Subset?
508

yes

Combine
Syndromes
518

no

Correctable?
516

yes

Correct
510

End

Combined
Syndromes

Use Combined
Syndromes in Full ECC
Decoder
520